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EXAMINER

HARRINGTON, ALICIA M

ART UNIT

PAPER NUMBER

2873

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/828,415

Applicant(s)

AMANAI, TAKAHIRO

Examiner

Alicia M. Harrington

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-7, 9, 10, 12 and 13 is/are rejected.
- 7) ☒ Claim(s) 4, 8 and 11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 4/21/04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 0404.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The Examiner has considered the information disclosure statement filed on 4/21/04.

### ***Specification***

2. The abstract of the disclosure is objected to because it contains claim language (for example “comprising”). Correction is required. See MPEP § 608.01(b).

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 7, 13/1 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamakawa (US 6,577,451).

Regarding claim 1, Yamakawa discloses an imaging optical system comprising (see abstract): in order from an object side (see figure 2 and Tables 1 and 2), a first lens having positive refracting power (R13, R14);

a second lens having negative refracting power (R15, R16), a concave surface of which is directed toward the object side,

a third lens having positive refracting power (R17, R18), a convex surface of which is directed toward an image side, and

a fourth lens having negative refracting power (R1, R2), wherein the second lens and the third lens are cemented.

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Regarding claim 2, Yamakawa discloses an imaging optical system according to claim 1 comprising:

an aperture stop (St) which is arranged at the object side of the first lens (see figure 2).

Regarding claim 7, Yamakawa discloses an imaging optical system according to claim 1, wherein the following condition is satisfied:

$0.5 < r2f/r3r < 4.0$  where  $r2f$  represents the radius of curvature of the second lens at the object side and  $r3r$  represents the radius of curvature of the third lens at the image side.

Regarding claim 13/1, Yamakawa discloses an imaging optical system according to claim 1 or 3 wherein the following condition is satisfied:

$-0.30 < Rave/Rc < 0.15$

where  $Rc$  represents the radius of curvature of the cemented surface of the cemented lens and  $Rave$  represents an average value of the radius of curvature of incident side and that of exit side (see Table 1; R15, R18, R17 for example).

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3,5,6,9,10,12,13/3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamakawa (US 6,577,451) in view of Saito (US 6,584,282).

Regarding claim 3, Yamakawa discloses an imaging optical system comprising:

in order from an object side, a first lens having positive refracting power (R13, R14),

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a second lens (R15, R16) having negative refracting power, a concave surface of which is directed toward the object side,

a third lens (R17, R18) having positive refracting power, a convex surface of which is directed toward an image side and

a fourth lens (R, R2) having negative refracting power, wherein the second lens and the third lens are cemented. However, Yamakawa fails to specifically disclose wherein the first lens consists of glass.

In the same field of endeavor, Saito discloses that include a glass lens in an imaging system is beneficial because plastic lens imaging characteristics change according to temperature fluctuations (see col. 3, lines 30-45). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a first lens consisting of glass, since plastic undergoes greater linear expansions and changes in refractive index according the temperature and glass will help to prevent imaging aberrations or misfocus.

Regarding claim 5, Yamakawa discloses an imaging optical system according to claim 3, wherein both refracting surfaces of the first lens are spherical (see Table 1).

Regarding claim 6, Yamakawa discloses an imaging optical system according to claim 3, wherein the following condition is satisfied:

$$0.4 < f/f_1 < 2.0$$

where  $f$  represents the focal length of the whole optical system and  $f_1$  represents the focal length of the first lens (see Table 1, lens radius R13, R14).

Regarding claim 9, Yamakawa discloses an imaging optical system according to claim 1, wherein the following condition is satisfied:

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$$0.6 < \text{EXP}/f < 2.0$$

where EXP represents the length from an object plane to an exit pupil and f represents the focal length of whole optical system (see Table 1).

Regarding claim 10, Yamakawa discloses an electronic instrument comprising the imaging optical system according to claim 1. (see abstract)

Regarding claim 12, Yamakawa discloses an imaging optical system according to claim 3, wherein the following condition is satisfied:

$$0.045 < \text{ML}/\text{TL} < 0.100$$

where TL represents whole length of the optical system and ML represents the minimum thickness on the axis of a plastic lens (see Table 1, d13 or d14).

Regarding claim 13/3, Yamakawa discloses an imaging optical system according to claim 1 or 3 wherein the following condition is satisfied:

$$-0.30 < \text{Rave}/\text{Rc} < 0.15$$

where Rc represents the radius of curvature of the cemented surface of the cemented lens and Rave represents an average value of the radius of curvature of incident side and that of exit side (see Table 1; R15, R18, R17 for example).

### ***Allowable Subject Matter***

7. Claims 4, 8, 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 4, prior art taken either singularly or in combination fails to anticipate or fairly

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suggest the limitations of the dependent claims, in such manner that a rejection under 35 U.S.C. 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claims, which at least include wherein the claimed condition is satisfied.

Regarding claim 8, prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of the dependent claims, in such manner that a rejection under 35 U.S.C. 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claims, which at least include wherein the composite focal length of the cemented lens consisting of the first, the second and the third lens,  $f_4$  represents the focal length of the fourth lens, and  $f$  represents the focal length of the whole optical system satisfying the claimed condition.

Regarding claim 11, prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of the dependent claims, in such manner that a rejection under 35 U.S.C. 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claims, which at least include where the  $F_{no}$  represents the Fnumber fully opened and  $P$  represents the pitch of imaging element satisfying the claimed condition.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Pfisterer (US 5,392,431) discloses a TV projection lens including a gradient index element.

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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alicia M. Harrington whose telephone number is 571 272 2330.

The examiner can normally be reached on Monday - Thursday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571 272 2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



AMH

Alicia M Harrington  
Examiner  
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